IMINARY REPORT
ALUPE CREEK & TRIBUTARIES
NTA CLARA COUNTY, CALIFORNIA
SEPTEMBER 1944

SCC Engineering Rept

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PRELIMINARY REPORT
ON THE
GUADALUPE CREEK & TRIBUTARIES
SANTA CLARA COUNTY, CALIFORNIA
FOR
FLOOD CONTROL AND RUNOFF

PREPARED BY THE
COUNTY ENGINEERING DEPARTMENT
OF THE
COUNTY OF SANTA CLARA COUNTY, CALIFORNIA

PUBLIC HEARING
BY THE
FLOOD CONTROL SECTION
OF THE
UNITED STATES ENGINEER OFFICE
WAR DEPARTMENT, UNITED STATES OF AMERICA
TO BE HELD AT THE
SAN JOSE CIVIC AUDITORIUM
SEPTEMBER 27, 1944

SANTA CLARA VALLEY WATER DISTRICT
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GENERAL DISCRIPTION OF THE PROPOSED
SANTA CLARA VALLEY FLOOD CONTROL PROJECT

INTRODUCTION

For many years that section of Santa Clara County from San Jose to Alviso between and adjacent to the Coyote and Guadalupe Creek Systems has been confronted each winter with a flood problem, due to the high water in these creeks. The situation is becoming more serious each year with the continual silting up of these creek channels. This silting up is further agravated by the growth of willows, tules, and the settlement of the valley floor. This condition also applies to the channels and land adjacent to the Campbell Creek System, the Permanente, San Antonio, Silver, Penitencia and Berryessa Creeks; and to a lesser degree along the lower end of the Stevens Creek.

The water shed area for these creeks and its tributaries is approximately 420 square miles of mountain area, not including the valley area. As the precipitation averages 2.5 times greater in the mountain area than in the valley area, one can visualize the great amount of run-off and debris that is carried.

Coyote Creek and its Tributaries

The source of this creek is in the mountain area north and east of Gilroy in the Mount Hamilton range. It contains 193 square miles of mountain drainage area. The Coyote and its tributaries have 278 square miles of mountain water shed area. The main tributaries are the Canada de los Osos, Packwood, Los Animas, Silver, and Penetencia Creeks. The Coyote flows in a general northwesterly direction traversing pra ctically the entire length of the county and enters the lower end of San Francisco Bay north of the town of Milpitas.

Rainfall and Run-off

The normal precipitation for (2) stations in the Coyote watershed area is 29.15 inches at Lick Observatory and 29.60 at Gilroy Hot Springs.

The estimated seasonal run-off, prior to the construction of the Coyote Dam, by a comparison of the discharge at the U.S.G.S. Gauging Station at Madrone, show the Coyote Creek to be 71,000 acre feet for an average normal period from 1903 to 1926. The maximum run-off was 204,000 acre feet for the season of 1906-1907.

The estimated foot-hill and mountain run-off forthe season of 1931-1932, measured at Madrone, was 69,800 acre feet. The estimated run-off measured near Edenvale, in the same year, was 56,400 acre feet. This was considered waste into San Francisco Bay, as the percolation is very negligible north of Edenvale. In addition, the waste from the combined total of the Silver, Penitencia and Berryessa Creeks was estimated at 3630 acre feet; making a total waste of the Coyote Creek System for the Season 1931-1932, at 60,030 acre feet.

The maximum discharge was estimated by H. L. Haehl, Consulting Engineer of San Francisco, at 25,000 C.F.S. on March 7, 1911, at Madrone. Also in January, 1914, at Madrone, about 1500 feet above the highway bridge, at the mouth of the canyon, 2¾ miles northeast of the town of Madrone, a test by the U.S.G.S. showed 24,000 C.F.S. discharge and a run-off for the month of January, 1914, to be 106,200 acre feet.

The Guadalupe Creek and Tributaries

The main tributary to the Guadalupe Creek System is the Los Gatos Creek. The source of this creek is high in the Santa Cruz Mountains, south and east of Los Gatos, and contains 40 square miles of mountain drainage area. It flows in a general northeasterly direction to its junction with the Guadalupe Creek at San Jose. The Guadalupe Creek and its tributaries have 81 square miles of mountain area watershed in the heaviest rainfall section of Santa Clara County.

The Alamitos Creek, the second largest tributary of the Guadalupe Creek, has its source in the Santa Cruz Mountains, south of Almaden, and has 35 square miles of mountain drainage area. It flows in a general northwesterly direction to its junction with the Guadalupe Creek, at the intersection of Coleman and Almaden Roads.

The Guadalupe, or Arroyo Seco de los Capitancillos, has its source high in the Santa Cruz Mountains, between Los Gatos and Almaden. It has 12.5 square miles of mountain drainage area and flows in a general northeasterly direction to its junction with the Alamitos Creek, at Coleman Road; thence northwesterly into San Francisco Bay, at the town of Alviso.

Rainfall and Run-off

The mountain area just south and west of Los Gatos has a precipitation ranging from 30 to 75 inches per season, and has frequent storms in which the rainfall is from 6 to 9 inches for a 24 hour period.

The estimated seasonal run-off of the Guadalupe Creek System at the U.S.G.S. Gauging Stations at the rim of the valley, prior to the construction of the Calero and Guadalupe Dams, was 55,000 acre feet for an average normal period between 1903 and 1926. The maximum run-off on the Los Gatos Creek alone, was estimated at 59,800 acre feet for the season of 1906-1907.

The estimated foot-hill and mountain run-off for the season of 1931-1932 was 28,300 acre feet at Los Gatos, on the Los Gatos Creek. The estimated run-off on the Alamitos Creek was 17,700 acre feet for the same season taken near Edenvale. The estimated run-off of the Guadalupe Creek, near Guadalupe, was 8,800 acre feet, for the season of 1931-1932. The total estimated run-off for the Guadalupe Creek System, for the season of 1931-1932, was 54,800 acre feet. The total waste into San Francisco Bay was estimated to be 32,100 acre feet, from records of the Guadalupe Creek, taken at San Jose, for the season of 1931-1932. There was no percolation beyond San Jose on the Guadalupe Creek it was estimated.

The maximum discharge of the Los Gatos Creek taken at the U.S.G.S. Guaging Station on the bridge near City Park, in the town of Los Gatos, on Feb. 2, 1940, showed 7,100 C.F.S. The maximum discharge on the Guadalupe Creek, at the River Street bridge in San Jose, showed 8,680 C.F.S. on the same date. There were large diversions above this point on both the Los Gatos and Guadalupe Creeks.

Campbell Creek System (including the San Tomas Aquino and Calabazas Creeks)

The source of these creeks is high in the Santa Cruz Mountains, south and southeast of Saratoga, containing 21 square miles of mountain drainage area. All flow in the general northeasterly direction, crossing the 101 State Highway, west of the town of Santa Clara. Thence in a northerly direction to the junction of the Campbell and San Tomas Aquino Creeks, just south of the Sunnyvale-Agnew Road, the Calabazas having previously joined the Campbell Creek, near the Southern Pacific Railway. Thence northwesterly into San Francisco Bay, near the town of Alviso.

Rainfall and Run-off

The normal precipitation for the watershed mountain area is practically the same as the Los Gatos Creek area, approximately 49 inches per season.

The estimated run-off for the season of 1931-1932, a season of approximate normal precipitation, was 9,766 acre feet for the Campbell Creek System. The location of these weirs were as follows:

1. Calabazas Creek, at Cupertino-Saratoga Road bridge.
2. Campbell " " " " " " .
3. San Tomas Aquino Creek, at Pollard Road.

The maximum discharge for the Campbell Creek alone, was 910 C.F.S. taken between the County Quarry and the Town of Saratoga, on February 13, 1937. The U.S.G.S. Gauging Stations located at the 101 Highway bridge, west of Santa Clara, recorded 641 C.F.S. on February 27, 1940. The U.S.G.S. Gauging Station on the San Tomas Aquino Creek, also located on the 101 State Highway, just west of Santa Clara, recorded 413 C.F.S. on the same date. There were large diversions above on both of these streams.

The Santa Clara Water Conservation District will also submit a report on the seasonal run-off, and percolation of the various streams of the valley at this hearing and that will give a recent picture of the valley streams since the construction of water conservation dams and percolation areas.

The condition of the Stevens, Permanente and San Antonio Creeks are similar to those of the Campbell Creek System, except that the channel of the Stevens Creek, since the construction of the water conservation dam, is sufficient to handle the flood waters except on the extreme lower end.

In the past thirty years there have been apparently 25 storms that have caused run-off in excess of the capacity of these creek channels to carry. The worst condition has been in the Guadalupe Creek Drainage System, when floods have caused considerable damage to property and highways, as well as loss of time and inconvenience for persons entering or leaving the flooded area.

The political subdivisions most interested in this Flood Control Project are as follows:

1. County of Santa Clara County, California.
2. City of San Jose, County of Santa Clara, California.
3. Town of Alviso, Santa Clara County, California.
4. State of California, Agnew State Hospital.

EXHIBIT NO. 1

MAP SHOWING OVERFLOW LANDS

This map of the San Jose Quandrangle shows the land that is innundated by the overflow waters of the Coyote, Guadalupe, Campbell and San Tomas Aquino Creeks.

The path and points of overflow of the flood waters as outlined on this map, together with the nature of crops grown, are shown as follows:-

1. Red is orchard land (mostly pears).
2. Green is pasture land as of the summer of 1944.
3. Pencil hatched is vegetable land as of the summer of 1944.

Pasture and vegetable land can quickly be interchanged and vice versa and this chart will not necessarily be correct say a few years hence. The orchard land can be considered fairly stable.

1. The amount of vegetable land innundated is estimated to be 1,030 acres.
2. The amount of orchard land innudated is estimated to be 2,540 acres.
3. The amount of pasture land innundated is estimated to be 1,730 acres.
4. The total amount is estimated at 5,300 acres innundated.

The price of this land ranges from $500 to $2000 per acre. Pasture land near San Francisco Bay being unfit for vegetable land, being in the $500 per acre bracket. Good pear land is estimated to be worth $2000 per acre, and vegetable land ranges from $1000 to $1500 per acre.

This chart does not show the overflow land that occurs higher up on these and smaller streams; such as the overflow of the Silver Creek in East San Jose, the Penitencia Creek in east and north of San Jose, and the Campbell and San Tomas Aquino Creeks south of the Southern Pacific Railway and 101 State Highway. The flooded area along the Permanente, San Antonio and lower end of Stevens Creek are also not shown on this map.

The amount of damage actually done to pasture and vegetable land is a matter of speculation and of course depends upon the nature of the crops grown. Water that stands for any length of time will naturally cause the roots of trees and plants to sour and ruin both pasture and orchard land. Vegetables will be completely destroyed even if water only covers it for a short while. Flowing water will cause cutting and scouring and the loss of valuable top soil through erosion in both orchard and pasture land. Standing water will deposit silt which will enrich the value of the soil, but which if allowed to continue will build up deposits around the trunk of the tree, which will gradually kill it, due to loss of breathing space. The same flood will cause damage to one portion of the orchard by erosion and then deposit the same in valuable silt in another portion of the same orchard, or it will carry the rich top soil from one ranch and deposit the same lower down on the land of another.

In conclusion, all floods destroy vegetables. Some floods both pasture and orchard land, and in the long range viewpoint, all floods damage both pasture and orchard land, because lands become water logged by the rising water table. The high water table is very noticeable in the growth of willows and tules in the drain ditches, along the present county highways in the flooded area. Some orchardists have already had to install tile drain ditches and pump the ground water back into the Guadalupe Creek channel in order to save their trees. It is only a question of time until many acres of orchard land, in the flooded area, will be ruined by a rising water table and much land that otherwise would be suitable for fruit can be used only for shallow rooted crops.

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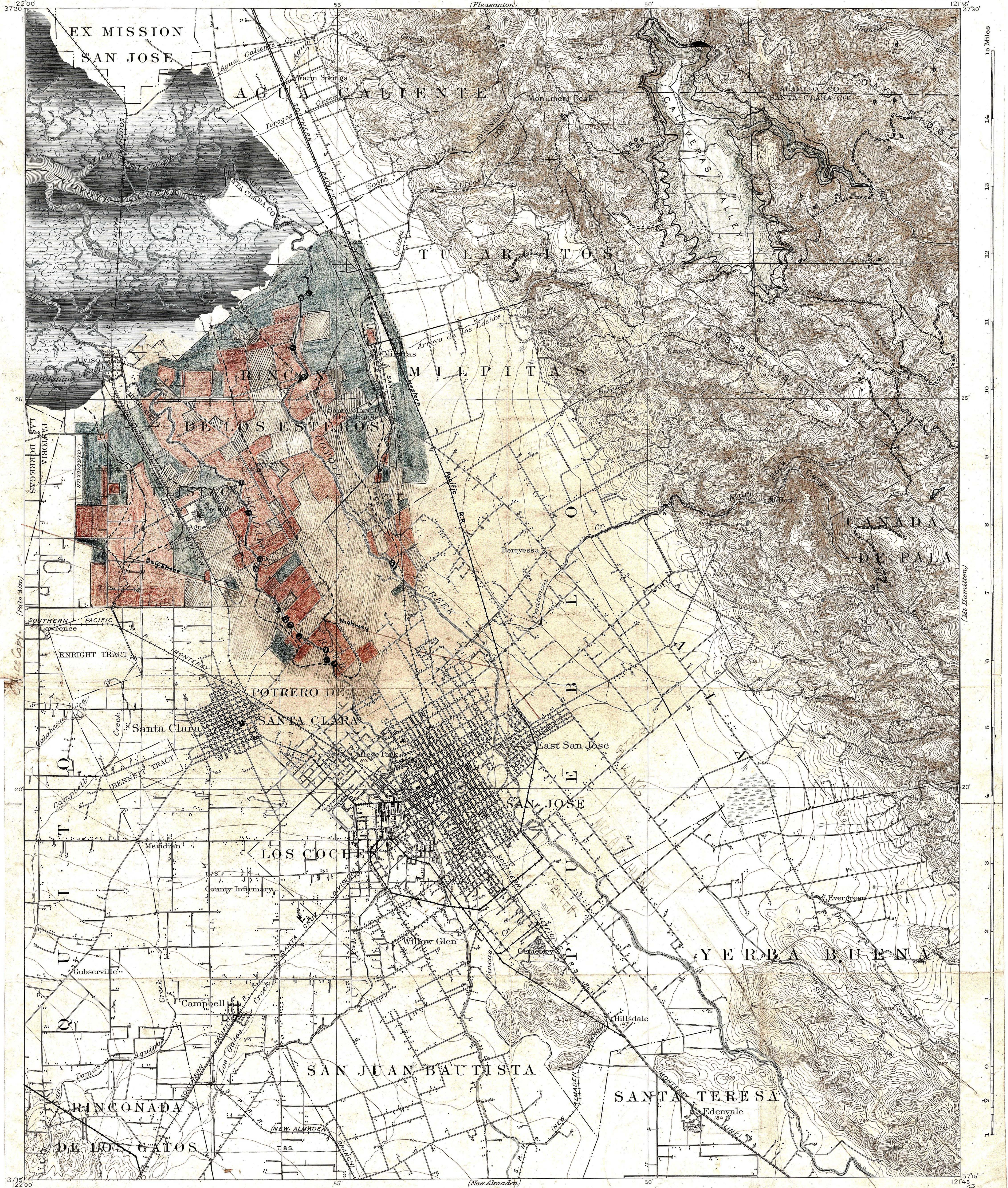
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

LEGEND
- - - - - = OVERFLOW LAND
⊖ = BREAKS IN CREEK BANK
RED = ORCHARD LAND
GREEN = PASTURE LAND
PENCIL HATCH = VEGETABLE LAND

EXHIBIT #1

CALIFORNIA
SAN JOSE QUADRANGLE



Henry Gannett, Chief Topographer.
R.U. Goode, Geographer in charge.
Triangulation by U.S. Coast and Geodetic Survey.
Topography by R.B. Marshall and U.S.C.&G.S.
Surveyed in 1895.

USC&GS
Marshall

Scale $\frac{1}{62500}$

Contour interval 25 feet.
Datum is mean sea level.

Surveyed by reconnaissance methods

To join Pleasanton use dotted projection corners

Edition of Mar. 1899, reprinted 1939
Polyconic projection. To place on North American datum move projection lines 680 feet south and 320 west

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SAN JOSE, CALIF.

STORMS - NOTES

(from Storm Chart)

One of the worst storms occurred during February of 1940, lasting seven days, from February 23 to February 29, inclusive. You will notice that heaviest precipitation occurred on the 27th and 28th of February, when 11 inches fell in the mountains west of Los Gatos, and 7.25 inches in Los Gatos itself. In other words, after 4 days of heavy rain, 12.73 inches or 81% of the storm was in the last 3 days. Practically all of that storm was run off as we had already had a storm starting January 1, that lasted 12 days with a precipitation of 20.81 inches in the mountains, and the seasonal rain fall was 38.78 inches, prior to the February storm.

Another severe storm was in December, 1937, when 13.44 inches fell in the mountains in 3 days, and 12.01 at Los Gatos for the same period of December 10, 11 and 12, of 1937.

February 11 to 25, inclusive, in the year of 1936, showed 15 days of continuous rain with 20.95 inches in the mountain area for that period.

December, of 1931, during the dry period, showed 23.88 inches for a storm lasting 10 days, from December 21, to December 30, inclusive. The record shows that 7.10 inches of rain fell on December 24, and 9.57 inches for the two days of December 27 and 28, in the mountain area.

March and April, of 1941, showed a storm of 16.01 inches for a storm lasting 8 days. This was a very wet season and prior to this storm the seasonal rainfall was 52.65 inches in the mountain area. Lake Ranch Reservoir had a seasonal rainfall of 74.51 inches for the season of 1940-1941.

January 20 to 24, inclusive, of 1943, showed 14.86 inches in the mountain area for a 5 day rainfall and on January 21, 7.58 inches were recorded in 24 hours.

You can see that we are dealing only with storms of recent years, part of which were in the dry period of 1919 to 1934. In years prior to 1919, we had many storms of greater duration and intensity than ~~is~~ are shown on the chart. It is safe to assume that in the wet period of 1885 to 1895, we had several storms of larger volume than is shown on the chart.

In the season of 1889-1890, San Jose had 30.30 inches of rain. Los Gatos had a seasonal of 67.22 inches for the same period, while records are not available for the mountain area west and south of Los Gatos for that season, a conservative estimate would be over 100 inches. (Since the normal for the mountain area is 1.7 greater than the Los Gatos normal.) We must have had several storms that season that caused the creeks to overflow their banks.

The intensity of the storms and not the dry or wet seasons, or a protracted wet spell is more indicative of a flood condition. The run-off is so much greater, and subsequent percolation loss when the velocity is greater. A study of the storm chart will show that some of our worst storms occurred in comparative dry seasons. For instance, the season of 1933-1934 was s very dry season. San Jose had only 9.25 inches for the season, and Los Gatos only 23.19 inches. In December of 1933, a storm of 4 days duration, starting on the 12th and ending on the 15th, in which the precipitation was 11.01 inches in the mountain area, and 5.62 inches at Los Gatos. On December 12, alone, 5.15 inches of rain fell in the mountain area in 24 hours. The season of 1927-1928 was also a dry season. San Jose had 9.95 inches and Los Gatos 24.59 inches for that season, yet a storm of 5 days, from March 23 to March 27, inclusive, showed a rainfall of 12.67 inches in the mountain area, and 6.56 inches in Los Gatos.

The storm chart shows that while the greater number of storms of great intensity did occur in the wet seasons, we also had them as well in the dry seasons. This clearly shows that the seasonal precipitation is not necessarily a true indication of the storm condition that causes floods.

Since the season of 1933-1934, the precipitation curve has started to move upward and a storm in January, 1943, caused considerable damage below the Campbell Street bridge, near the town of Campbell, on the Los Gatos Creek.

The rainfall in the hills in the vicinity of Los Gatos was 12 to 15 inches, with a precipitation of 7.58 inches in the mountain area on January 21. This caused a wall of water to rush down the Los Gatos Creek and undermine a high bank at the above mentioned location. It is estimated that a section 500 feet long, 50 feet wide, by 20 feet high, approximately 20,000 cubic yards of bank was cut away. One home above on the bank had to be moved (at considerable expense to the County) to a new location. The water had cut so deep that the lives of the occupants were in danger, as a great portion of their lot had fallen into the stream. This great amount of dirt was not deposited in the channel of the Los Gatos Creek, between Campbell and San Jose, because the gradient is steep, the channel is large and clean, and the velocity of the waters naturally swift. It was deposited in the already restricted channel area north of San Jose, where the gradient is flat and the channel obstructed by willows and tules, and on the overflow land as silt.

STORM CHART

(Exhibit No. 5)
(Records of San Jose Water Co.)

	SAN JOSE		LOS GATOS		LAKE RANCH RESERVOIR	
	Seasonal to Date	Storm Inches	Seasonal to Date	Storm Inches	Seasonal to Date	Storm Inches
1928						
Mar. 23	7.42	0.26	15.55	0.43	28.22	1.15
" 24		.52		2.23		3.97
" 25		.05		1.25		3.00
" 26		.37		1.10		1.58
" 27		.40		1.65		2.97
TOTAL	9.02	1.60	22.11	6.56	40.89	12.67
1931						
Dec. 21	3.39	.26	5.36	.65	11.00	.87
" 22		.10		.15		.40
" 23		.30		1.57		2.42
" 24		1.00		3.18		7.10
" 25		.44		.53		1.00
" 26		.12		.03		.18
" 27		1.03		3.24		5.57
" 28		.80		2.74		4.00
" 29		.13		0.06		.44
" 30		.23		.40		1.90
TOTAL	7.80	4.41	17.91	12.55	34.88	23.88
1933						
Dec. 12	1.07	.79	3.02	2.80	6.22	5.15
" 13		.52		1.55		3.30
" 14		.17		.27		1.00
" 15		.47		1.00		1.56
TOTAL	3.02	1.95	8.64	5.62	17.23	11.01
1936						
Feb. 11	6.25	.67	11.18	1.31	23.54	3.30
" 12		1.01		2.04		2.40
" 13		.33		.80		2.50
" 14		.16		.33		1.20
" 15		.15		.36		1.00
" 16		.15		.48		1.06
" 17		.01		.11		.13
" 18		.56		.83		1.25
" 19		.04		.73		.50
" 20		.01		.00		.14
" 21		.22		.46		2.25
" 22		.50		1.60		3.10
" 23		.16		.54		1.12
" 24		.09		.06		.25
" 25		.15		.45		.75
TOTAL	10.46	4.21	21.28	10.10	44.49	20.95

Kendall

Thomas
Mrs. Hancock (Engr. Sec.)

STORM CHART

(Exhibit No. 5)
(Records of San Jose Water Co.)

	SAN JOSE		LOS GATOS		LAKE RANCH RESERVOIR	
	Seasonal to Date	Storm Inches	Seasonal to Date	Storm Inches	Seasonal to Date	Storm Inches
1937						
Dec. 10	2.07	1.00	4.15	5.19	7.61	6.40
" 11		1.00		6.04		5.35
" 12		.30		.78		1.69
TOTAL	4.37	2.30	16.16	12.01	21.05	13.44
1938						
Feb. 1	7.75	1.20	20.03	1.73	29.38	3.16
" 2		.30		3.78		.80
" 3		.65		.55		3.08
" 4		.60		1.94		1.70
" 5		.05		1.22		.27
" 6		.30		.18		1.10
" 7		.00		1.39		1.04
TOTAL	10.85	3.10	30.82	10.79	40.53	11.15
1938						
Feb. 10	10.85	.30	30.82	.28	40.53	.58
" 11		.75		1.31		1.60
" 12		.98		2.09		1.85
" 13		.20		.80		.92
" 14		.60		.81		1.06
" 15		.40		1.93		2.20
TOTAL	14.08	3.23	38.04	7.22	48.74	8.21
1940						
Jan. 1	1.86	.72	3.39	.49	6.03	.90
" 2		.15		2.46		4.10
" 3		.00		.20		.63
" 4		.30		1.03		2.36
" 5		.00		.03		.08
" 6		.31		.66		.65
" 7		.36		.36		.73
" 8		.62		1.80		4.28
" 9		.33		1.58		4.11
" 10		.31		.42		.97
" 11		.95		.87		1.77
" 12		.00		.18		.23
TOTAL	5.91	4.05	13.47	10.08	26.84	20.81

STORM CHART

(Exhibit No. 5)
(Records of San Jose Water Co.)

	SAN JOSE		LOS GATOS		LAKE RANCH RESERVOIR	
	Seasonal to Date	Storm Inches	Seasonal to Date	Storm Inches	Seasonal to Date	Storm Inches
1940						
Feb. 23	9.32	.28	20.08	.53	38.78	.54
" 24		.00		.04		.20
" 25		.29		.80		1.45
" 26		.68		.27		.78
" 27		1.05		4.04		6.18
" 28		1.25		3.23		5.00
" 29		.51		.69		1.55
TOTAL	13.38	4.06	29.68	9.60	54.48	15.70
1940						
Dec. 16	0.99	.28	2.09	.60	4.64	.76
" 17		.32		1.60		1.06
" 18		1.02		2.76		1.32
" 19		.07		.47		.62
" 20		.00		.00		.07
" 21		.03		.14		.63
" 22		.71		1.88		1.74
" 23		.96		2.43		1.20
" 24		.40		.81		1.09
" 25		.25		.83		1.09
" 26		.15		.30		1.20
" 27		.50		1.61		1.98
" 28		.63		.96		.95
TOTAL	6.31	5.32	16.48	14.39	18.35	13.71
1941						
Mar. 28	16.52	.07	39.84	.58	52.65	.95
" 29		.44		1.40		2.57
" 30		.08		1.00		3.18
" 31		.89		2.07		3.20
Apr. 1		.37		.58		.96
" 2		.35		.69		1.15
" 3		.02		1.24		1.63
" 4		.37		2.12		2.37
TOTAL	19.11	2.59	49.52	9.68	68.66	16.01
1942						
Jan. 22	6.36	.20	14.38	1.44	23.27	1.95
" 23		.07		.55		.80
" 24		2.00		3.12		4.50
" 25		.36		2.79		3.51
" 26		.14		.12		.70
" 27		.52		1.36		2.34
TOTAL	9.65	3.29	23.76	9.38	37.07	13.80

STORM CHART

(Exhibit No. 5)
(Records of San Jose Water Co.)

	SAN JOSE		LOS GATOS		LAKE RANCH RESERVOIR	
	Seasonal to Date	Storm Inches	Seasonal to Date	Storm Inches	Seasonal to Date	Storm Inches
1943						
Jan. 20	3.42	.00	8.21	.23	15.76	.50
" 21		1.50		5.42		7.58
" 22		.66		3.71		3.15
" 23		1.17		1.53		3.13
" 24		.08		.23		.50
TOTAL	6.83	3.41	19.33	11.12	30.62	14.86

1952

EXHIBIT NO. 2

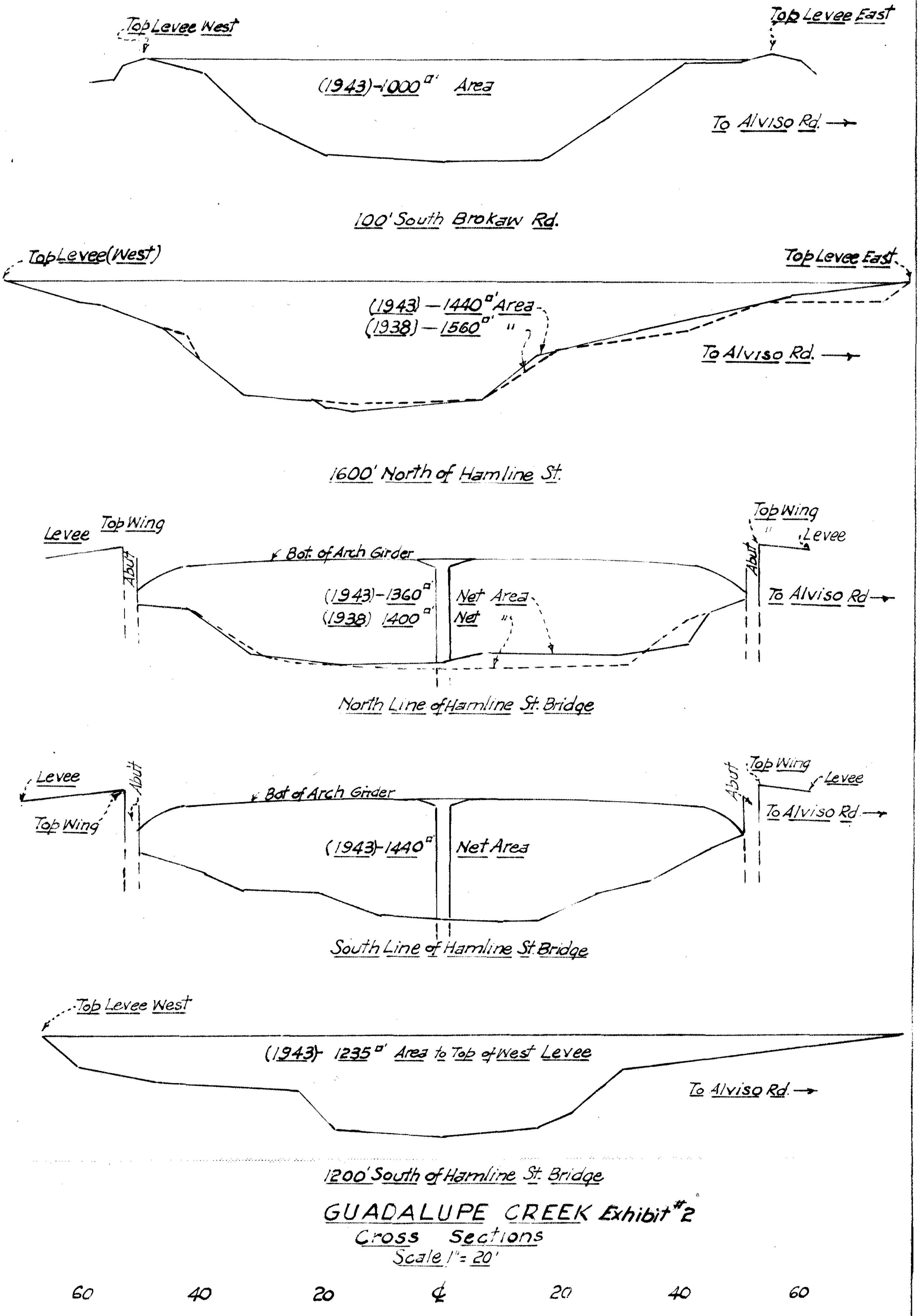
CROSS SECTIONS OF GUADALUPE AND COYOTE CREEK CHANNELS

This cross sectional area of the Guadalupe shows the silting and in one case (namely the Brokaw Road bridge) the scouring that has taken place in the last five years.

The average cross sectional area at the bridge, excluding the Brokaw Road bridge, is only 91% of what it was in 1938. It is safe to assume that the net loss, in channel area outside of the sections at the bridges, was much greater due to growth of tules, willows, trees and other vegetable matter.

You will notice also at the Bayshore Highway bridge, the area is only 81% of what it was in 1938. This can be explained by the fact that the gradient becomes flatter and the velocity of the stream slower as we move north. This loss of 10% in the last five years shows what would happen if no measures were taken to relieve the situation.

The Coyote Creek channel, at the Trimble Road bridge, is 89% of what it was at time of the construction of the bridge. The channel of the Coyote at the Milpitas-Alviso Road bridge shows 92% capacity compared with the capacity at the construction date.

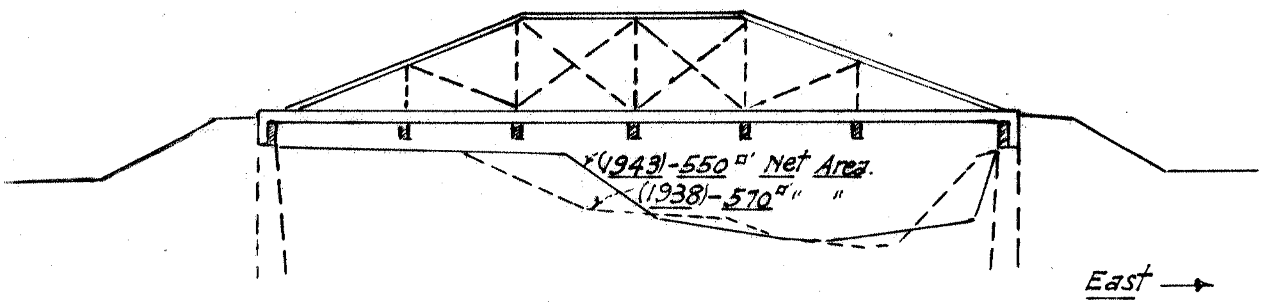


GUADALUPE CREEK Exhibit #2

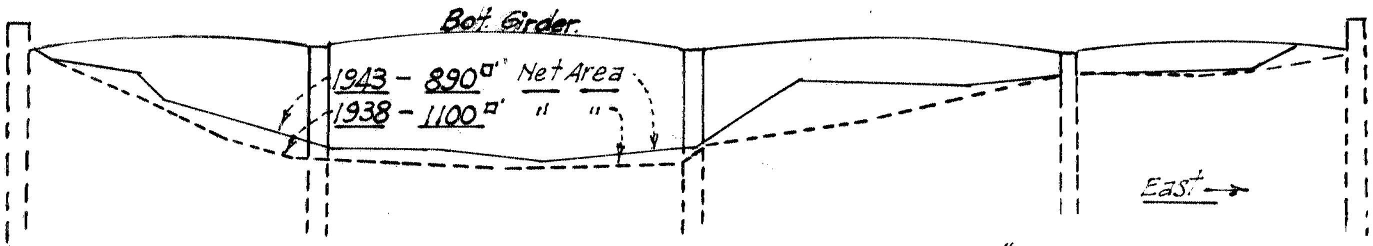
Cross Sections

Scale 1" = 20'

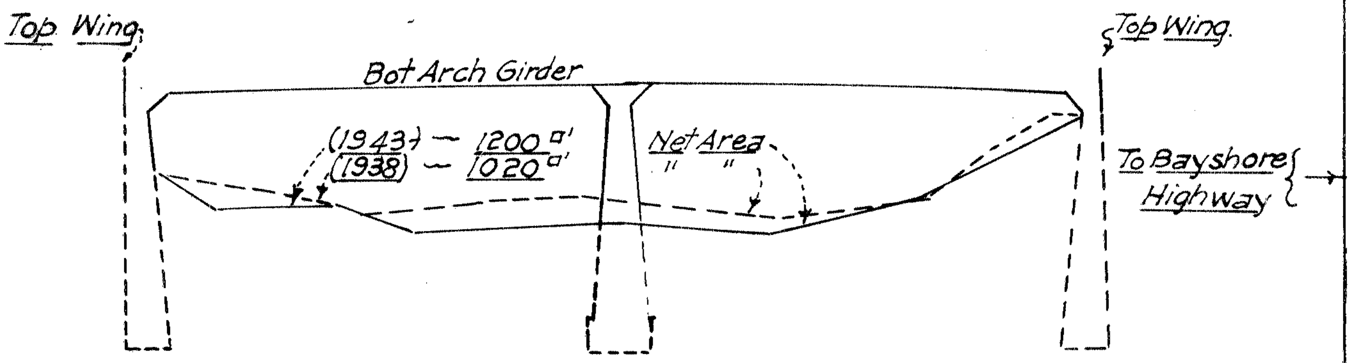
60 40 20 ℄ 20 40 60



South Line Montaque Road Bridge



South Line Bayshore Hi'way Bridge # 37-37
Main Channel



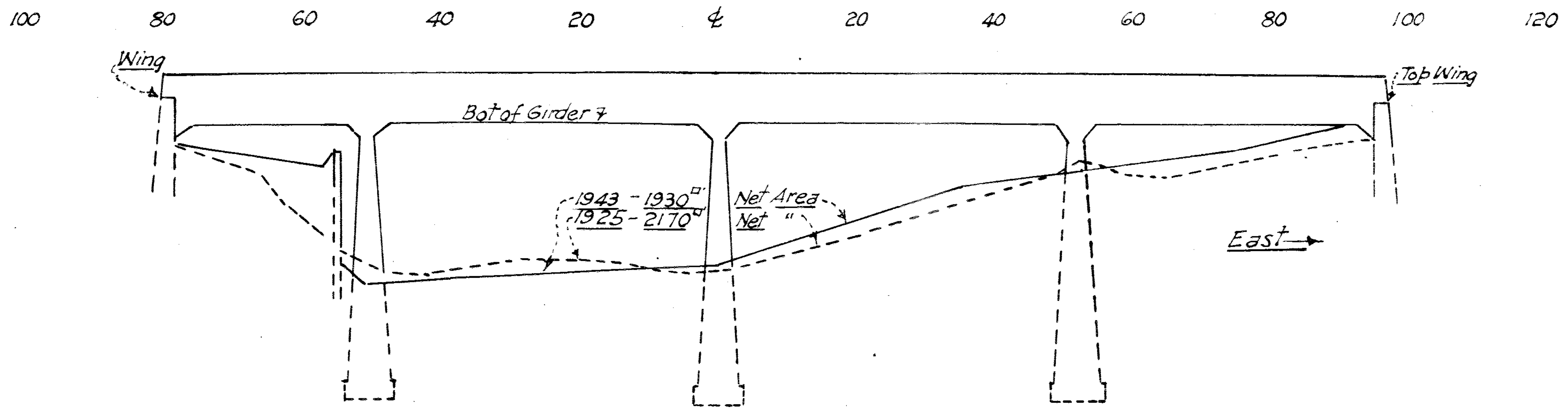
South Line Brokaw Rd Bridge

GUADALUPE CREEK (Con't) Exhibit #2

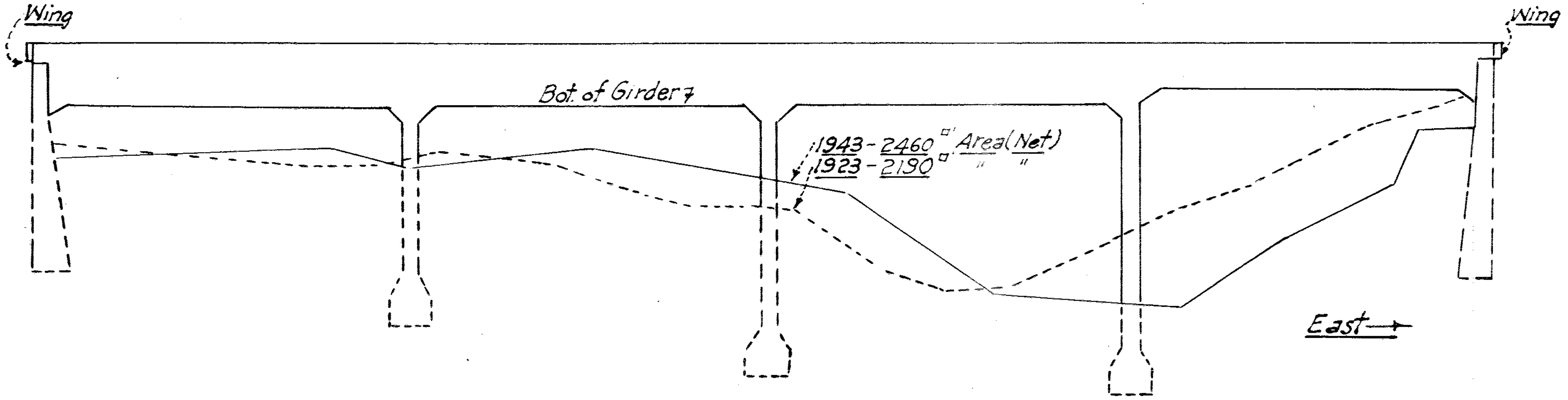
Cross Sections

Scale 1" = 20'

60 40 20 ℄ 20 40 60



South Line Trimble Rd Bridge

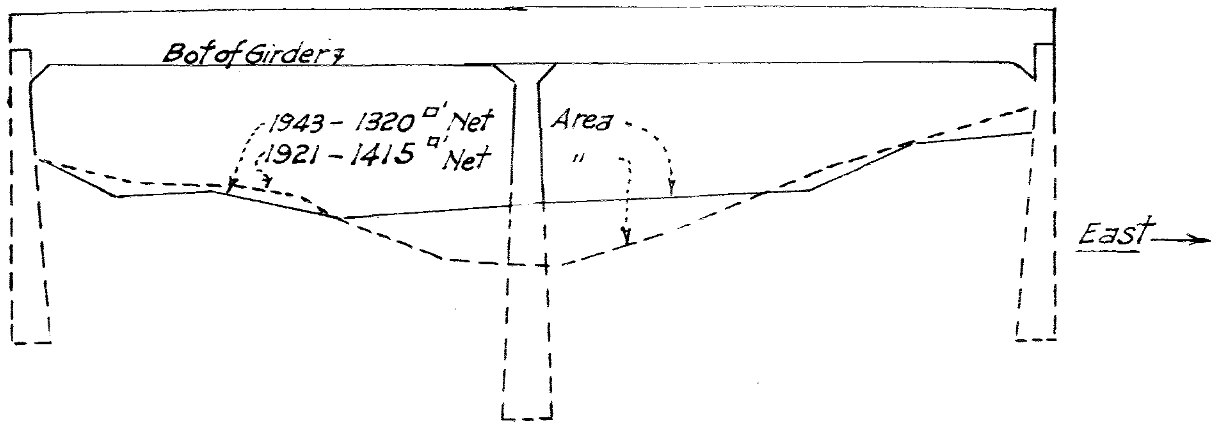


South Line Maybury Rd. Bridge

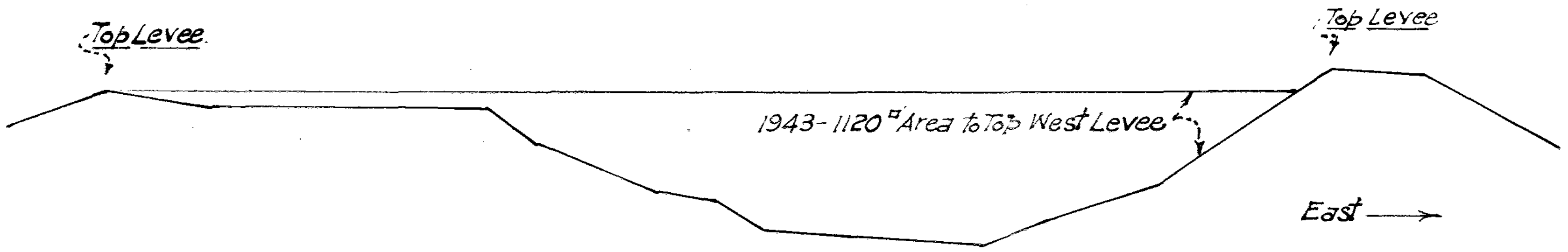
COYOTE CREEK Exhibit #2

Cross Sections

Scale 1" = 20'



South Line Alviso-Milpitas Rd. Bridge



700' South of Alviso-Milpitas Rd. Bridge

COYOTE CREEK (Cont.) Exhibit #2
Cross Sections
Scale 1"= 20

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COUNTY FLOOD CONTROL AND
WATER DISTRICT
DO NOT REMOVE FROM OFFICE

EXHIBIT NO. 3

PRECIPITATION CURVE

(GUADALUPE CREEK DRAINAGE AREA)

This rainfall curve shows the seasonal precipitation for the last 57 years for San Jose and Los Gatos; and for the last 16 years for the Lake Ranch Reservoir of the San Jose Water Company.

These three localities show very clearly the maximum, mean and minimum rainfall for the Los Gatos Creek drainage area.

Lake Ranch Reservoir, located 10 miles south of Los Gatos, high up in the Santa Cruz Mountains at an elevation of 1800 feet, has the heaviest rainfall of all the Rain Gauge Recording Stations of the San Jose Water Company.

Los Gatos, located 12 miles south of San Jose at the base of the Santa Cruz Mountains, has an elevation of 545 ± above sea level and can be considered as the locality having the mean or average rainfall for the Los Gatos Creek drainage area. It has a normal precipitation of 31.55 inches per season. As 86% of this rainfall occurs between the months of November and April, one can see that heavy storms for two weeks duration are not uncommon. The run-off from the mountain area is very fast due to the difference in elevation between that area and the valley area. The resultant storms carry on enormous amount of silt and debris; and the lower end of the creek channel is silting up very fast. The flood waters are overflowing their banks in 10 to 15 places between San Jose and Alviso, a distance of 7 miles.

The rainfall for the San Jose area is not a true indication of the precipitation for the Guadalupe Creek drainage area. It is the lightest of any of the areas in that water system, and can be safely called the minimum precipitation area for the Guadalupe Creek drainage area.

The precipitation for the high mountain area south of Los Gatos, averages nearly 50 inches per season. As most of this is run-off, due to the intensity of the storm, (5 to 9 inches frequently in 24 hours) the rainfall there really determines the volume of flood waters in the Guadalupe Creek.

Another interesting item can be discovered by a careful examination of the precipitation curves for San Jose and Los Gatos. San Jose's normal rainfall is 14.49 inches per season, while Los Gatos has a normal of 31.55 inches or 2.2 times greater than San Jose or a difference of 17 inches. In the wet seasons, Los Gatos averages 2.6 times greater than San Jose, with differences ranging from 20 to 37 inches. While in the dry seasons Los Gatos averages 1.7 times greater than San Jose, with differences ranging from 4 to 18 inches. This same ratio holds true when we compare the differences between Los Gatos and the mountain area south of Los Gatos.

The mountain area of the Alamitos and Guadalupe Creeks has practically the same precipitation as the mountain drainage area of the Los Gatos Creek.

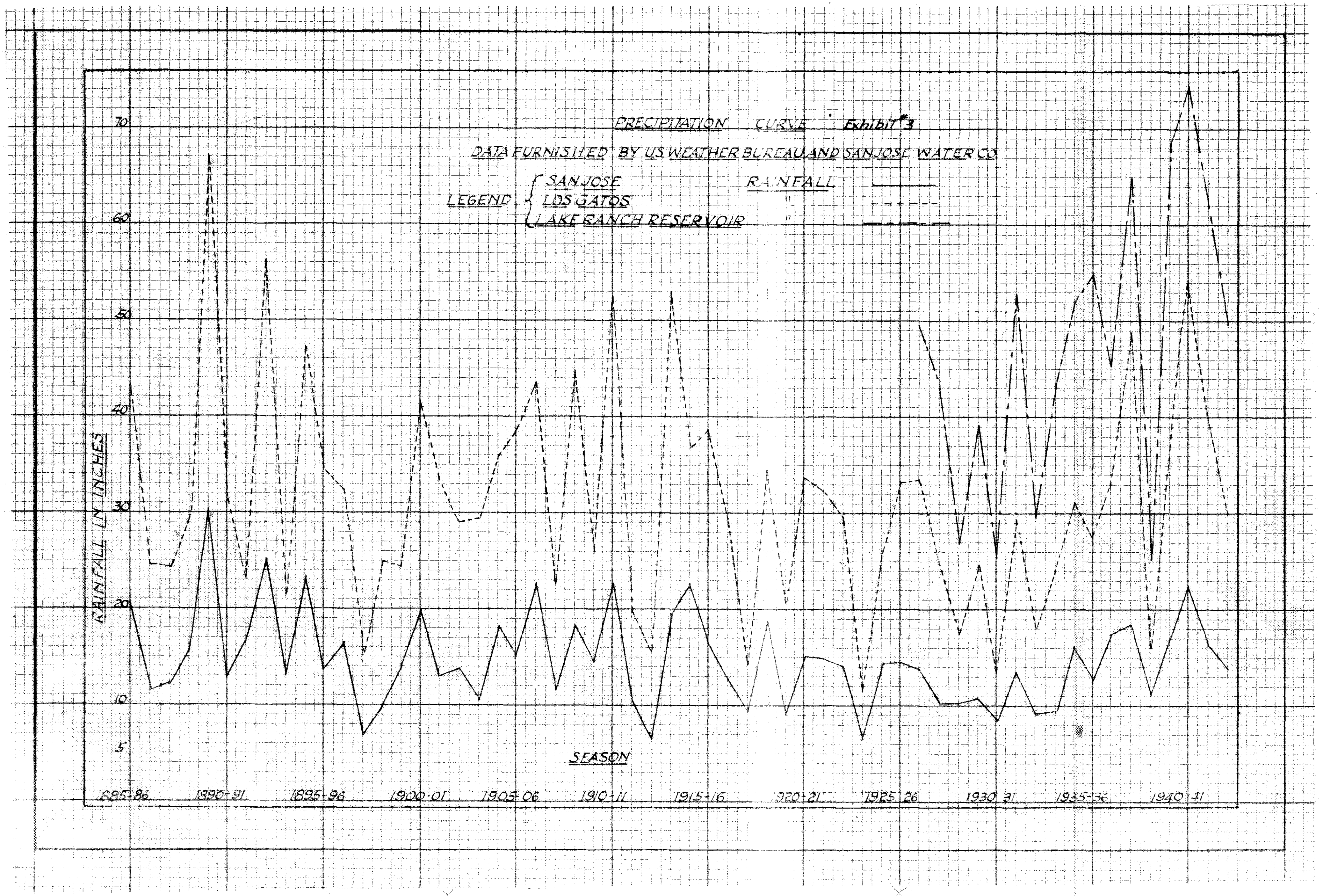
A study of the precipitation chart also reveals that the seasons from 1919-1920, to and including the season of 1933-1934, a period of 15 years, were the lightest on record, and can be safely designated as the dry period. Since that date, the curve has approached a more normal period that occurred prior to 1919-1920. We must and should be prepared for a repetition of the period between the seasons of 1885-1886 and 1895-1896, when the average seasonal rainfall for San Jose was 18 inches for the ten year period, against a normal seasonal rainfall or 14.5 inches. And compared to an average seasonal rainfall of only 11 inches in the 15 year dry period between seasons of 1919-1920 and 1933-1934, inclusive.

The Los Gatos comparison between the normal, dry and wet seasons are as follows:

Dry period - 1919-1920 to 1933-1934 (inclusive)
equals 24 inches average per season.

Wet period - 1885-1886 to 1895-1896 (inclusive)
equals 37 inches average per season.

Normal rainfall - (as of to date)
equals 31.55 inches per season.



PRECIPITATION CURVE Exhibit #3

DATA FURNISHED BY US WEATHER BUREAU AND SAN JOSE WATER CO

EXHIBIT NO. 4

CAPACITY CURVES

GUADALUPE CREEK SYSTEM

This curve shows clearly what is happening to the restricted area of the Guadalupe Creek channel north of the Hamline Street bridge. The capacity of the channel, 1600 feet north of Hamline Street bridge, is 1360 square feet, while 100 feet south of the Brokaw Road bridge, the channel has a capacity of only 1000 square feet, a decrease of 360 square feet in a distance of approximately 6000 feet.

A much greater change is shown after we leave Brokaw Road. The capacity of the channel 200 feet south of the Bayshore Highway is only 400 square feet, a decrease of 600 square feet in 5600 feet distance. In other words, the channel from a point 1600 feet north of the Hamline Street bridge to a point 200 feet south of the Bayshore Highway, a distance of 11,600 feet, has decreased in capacity from 1360 square feet to 400 square feet, a decrease of 960 square feet or 70%.

From a point 200 feet south of the Bayshore Highway to a point 100 feet south of the Montague Road, the capacity of the channel has decreased from 400 square feet to 312 square feet, a decrease of 88 square feet.

From a point 100 feet south of the Montague Road to a point 2000 feet north of the Montague Road, the capacity has decreased from 312 square feet to 170 square feet, a decrease of 142 square feet.

Summary

The channel of the Guadalupe, from a point 1600 feet north of Hamline Street bridge to a point 2000 feet north of the Montague Road bridge, a distance of approximately 22,000 feet, has decreased in capacity from 1360 square feet to 170 square feet, a decrease of 1190 square feet or 87.5%.

One can see at a glance that the capacity of the Guadalupe Creek, north of the Brokaw Road, is so small that not only a heavy storm but a moderate one would cause the creek to overflow its banks in numerous places.

It is safe to say that the Guadalupe Creek has flooded the surrounding territory, as shown on the "Map showing Overflow and Flooded Area", an average of at least once a year, because in the wet seasons it has overflowed several times a season.

Any storm greater than 9000 C.F.S. will cause an overflow of the Guadalupe Creek south of the Hamline Street bridge, while only a storm of 3000 C.F.S. would cause an overflow between Brokaw Road and the Bayshore Highway. Between the Bayshore Highway and Montague Road, a storm of 1500 C.F.S. would cause a flood. From Montague Road north, any storm in excess of 600 C.F.S. due to the small area, flat gradient and pressure from the tides in San Francisco Bay will cause the creek to overflow its banks.

Another serious menace, that the continual silting and consequent decrease in capacity of the Guadalupe Creek will cause, is the creation of a new channel by the flood waters. We have a case of this kind in the Los Gatos Creek, which left its banks, near the town of Campbell, and cut an entirely new channel, leaving the old channel, now known as "Dry Creek", high and dry. This condition is not only possible but probable if the present channel is left to the whims of nature.

Naturally this would cause a loss running into hundreds of thousands of dollars, as well as the possibility of loss of lives.

Coyote Creek System

All of the conditions that apply to the Guadalupe apply to the Coyote Creek as well, only to a lesser degree, because the Coyote Reservoir has helped to alleviate flood conditions on that stream. The capacity of the Coyote Channel though has decreased from 2460 square feet area at the Maybury Road bridge, to 1120 square feet area 700 feet south of the Alviso-Milpitas Road bridge, a decrease of 1340 square feet or 54.5%.

A study of the "Map showing Overflow and Flooded Area" will reveal that the Coyote continues to overflow its banks in several places between Oakland Road bridge and its entrance into San Francisco Bay in the wet seasons.

Campbell Creek System

The capacity curves of the Campbell and San Tomas Aquino Creeks also show a marked decrease as it moves toward San Francisco Bay; and the incapacity of these two existing stream channels to care for the run-off, due to long continued or heavy precipitation in the mountain areas, has been amply demonstrated numerous times during the last few years. This condition is further agravated by the growth of brush and the dumping of refuse into the creek channels. This condition exists on all streams to a certain extent, but is most marked on the streams of the Campbell Creek system from Homestead Road to Agnew. In addition to the flooded area as shown on "Map of Overflow Lands" these creeks overflow the adjacent land between Southern Pacific Railway and the 101 State Highway and lands south of the 101 State Highway, because the channels of these streams are ~~is~~ inadequate to handle the storm waters, due to continual silting up and growth of vegetable matter.

As previously stated the conditions of channels of the Stevens, Permanente and San Antonio are similar to those of the Guadalupe, Coyote and Campbell Creek systems.

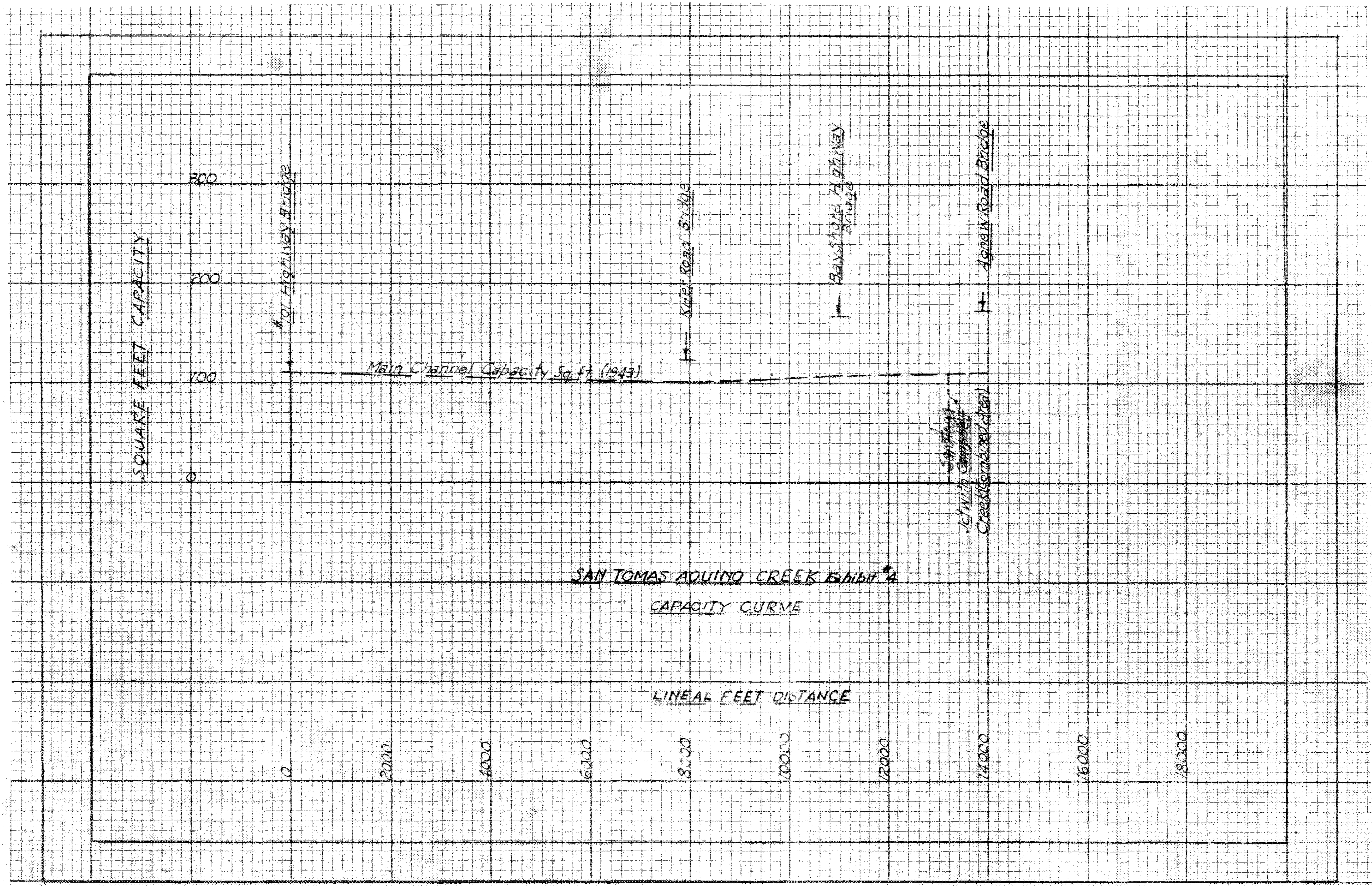
Recommendations

The widening and cleaning out of the channels of the Coyote, Guadalupe, Campbell, Stevens, Permanente and San Antonio Creeks is the only solution to solving these flood conditions. The deepening of the channels will not help as the gradient is very flat as we approach San Francisco Bay, due to the settlement of the valley floor of approximately 6 feet and will silt up in time.

Recommended Channel Enlargements

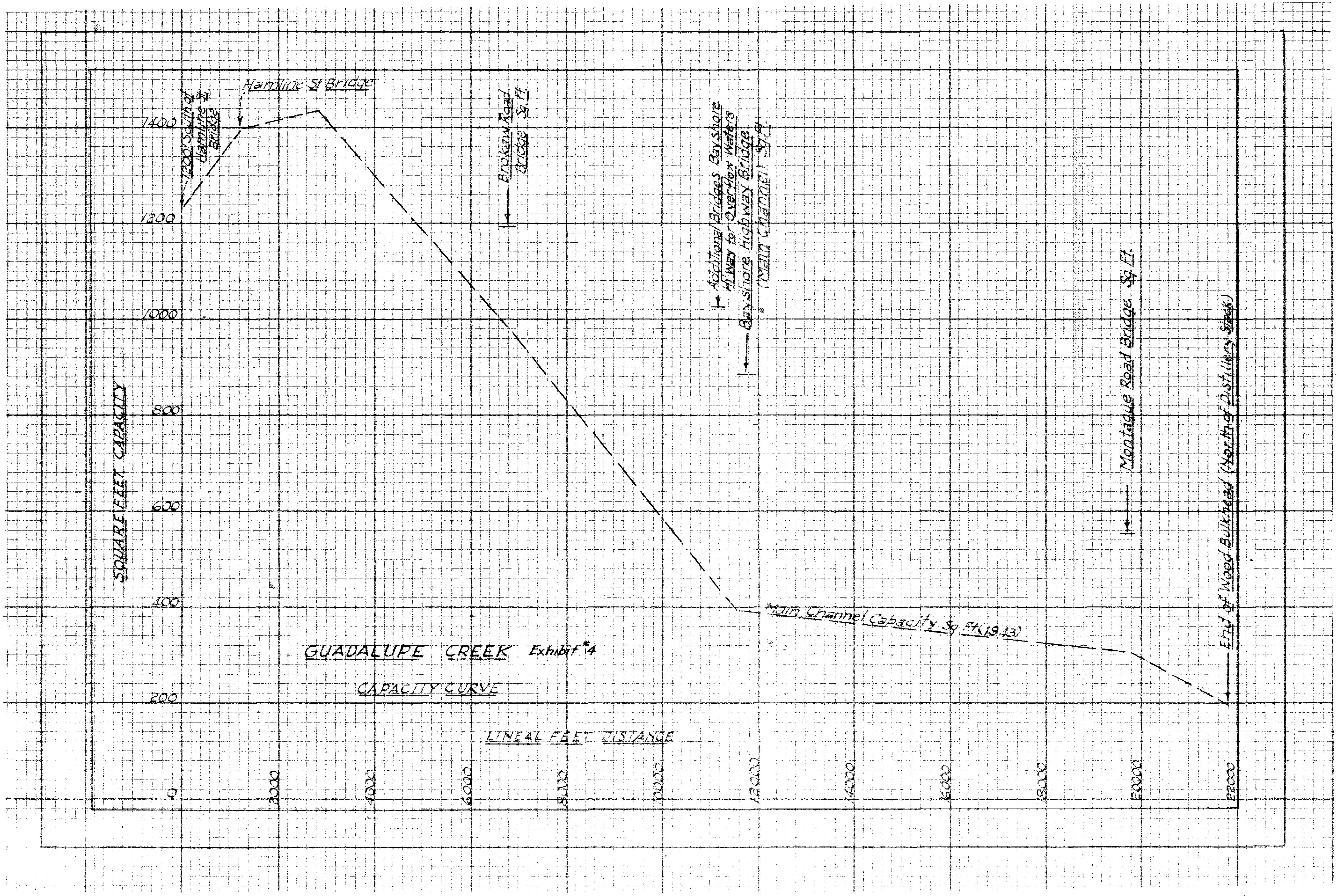
Guadalupe channel should have -	11,500 C.F.S.
Coyote " " "	15,000 " " "
San Tomas " " "	1,000 " " "
Campbell " " "	1,000 " " "
Campbell Creek after junction with San Tomas	2,000 " " "
Stevens Creek channel should have	1,000 " " "
San Antonio Creek channel should have	300 " " "
Permanente Creek channel should have	300 " " "

In all cases the capacity of the creek channels at the bridges and culverts are adequate to carry much larger flow than can be confined within the creek banks. The actual carrying capacity of the upper and lower points as shown on the capacity curve are more divergent than the cross section figures show, because the grade is flatter and the flow naturally slower at the lower end.



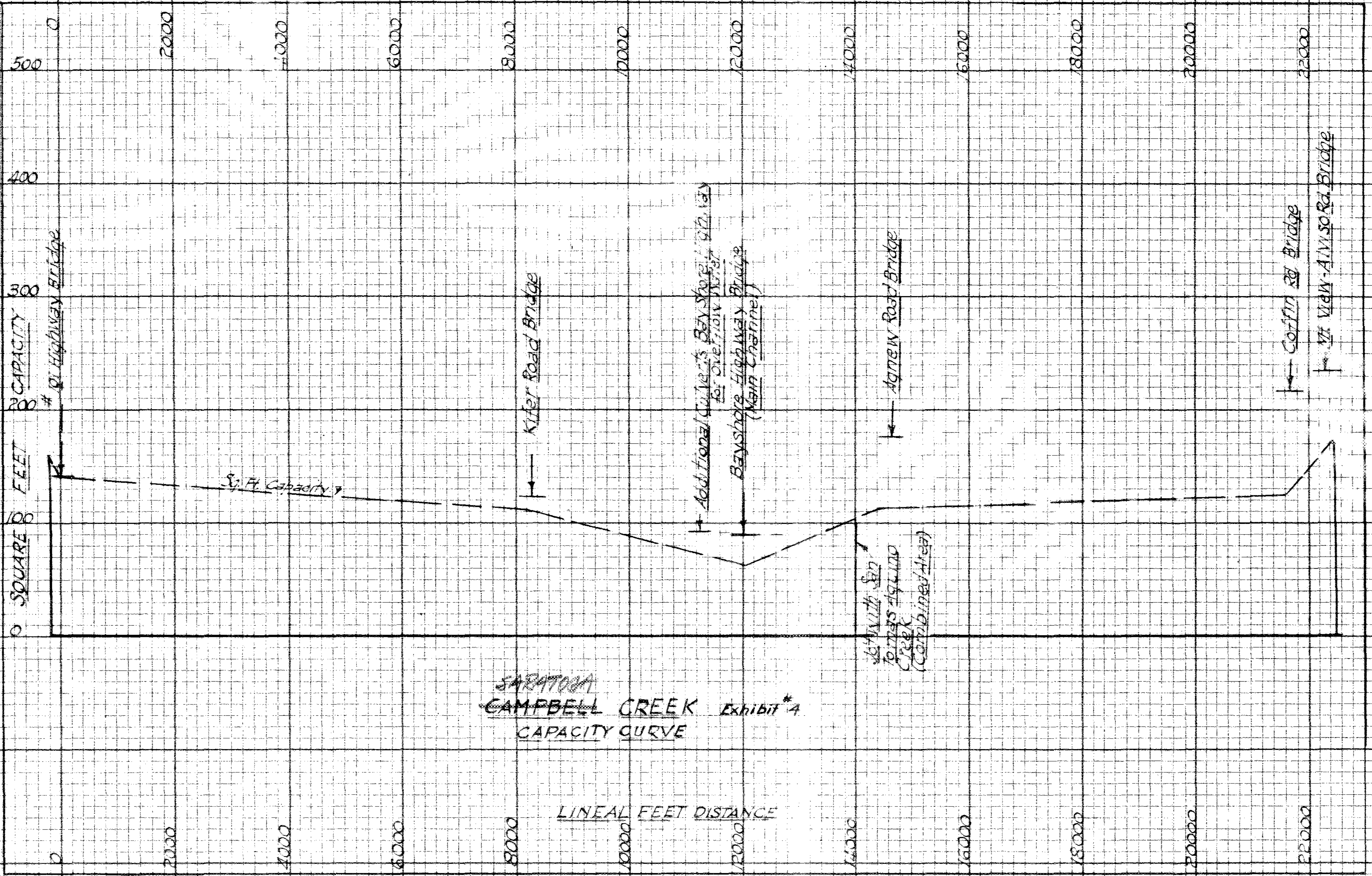
SAN TOMAS AQUINO CREEK Exhibit #4

CAPACITY CURVE



GUADALUPE CREEK Exhibit #4

CAPACITY CURVE



SARATOGA
~~CAMPBELL~~ CREEK Exhibit #4
CAPACITY CURVE

PROPOSED IMPROVEMENTS OF GUADALUPE CREEK

The following improvements are recommended:

(1) Enlarge the channel by widening between San Jose City Limits at Rosa Street and Brokaw Road bridge, a distance of 9200 feet.

Channel dimensions: Bottom 50 feet wide; top 114 feet wide; depth 16 feet.
Estimated cost. - 113,000 c.y. $ 22,600

(2) Enlarge the channel by widening between Brokaw Road bridge and Bayshore Highway, a distance of 5700 feet.

Channel dimensions: Bottom 60 feet wide; top 116 feet wide; depth 14 feet.
Estimated cost. - 99,500 c.y. $ 19,900

(3) Enlarge the channel by widening between Bayshore Highway and 3000 feet south of Montague Road, a distance of 5000 feet.

Channel dimensions: Bottom 70 feet wide; top 126 feet wide; depth 14 feet.
Estimated cost. - 117,600 c.y. $ 23,520

(4) Enlarge the channel by widening between a point 3000 feet south of the Montague Road and Alviso Highway bridge, at Alviso, a distance of 30,500 feet.

Channel dimensions: Bottom 110 feet wide; top 158 feet wide; depth 12 feet.
Estimated cost. - 769,900 c.y. $ 153,980

Engineering and contingencies $ 22,000

Total estimated cost $ 242,000

as computed @ $0.20/cu yd

1952 price - est. @ $0.60/cu yd × 3

$726,000